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ABSTRACT

Evaluation problems evolving from certain objectives of intervention programs and from the characteristics of the target population are investigated. The intellectual process approach of experimental education with its emphasis on conative and motive objectives requires an evaluation technique capable of reflecting the desired behaviors more accurately, and of testing poor children adequately. Lower verbal ability and interpretation difficulties of poor children reduce the effectiveness of achievement tests for assessing the results of experimental education. The advantages of situational tests are noted and it is suggested that tests of this type are necessary for more adequate representation of the effects of intervention, given the characteristics of the target population. (LR)

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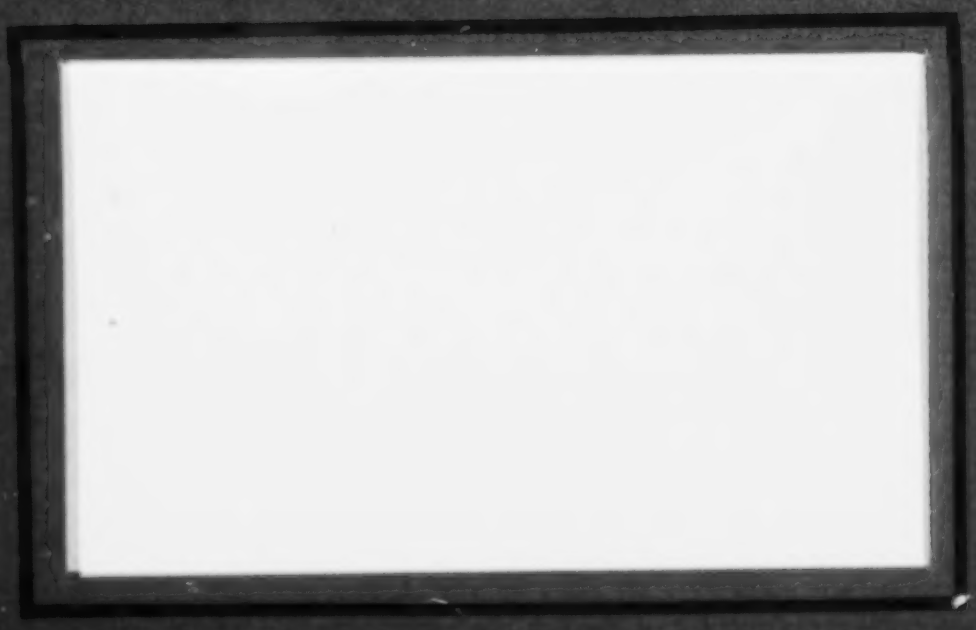

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SITUATIONAL TESTS FOR EVALUATION OF INTERVENTION PROGRAMS: A POSITION

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SITUATIONAL TESTS FOR EVALUATION OF INTERVENTION PROGRAMS: A POSITION

Sadie A. Grimmett

Current educational programs designed to intervene into the economically poor child's schooling experiences implicity or explicity presume divergence from those schooling programs labeled "traditional" (U. S. Office of Education, 1969). Assessment of the impact of this difference on performance levels is frequently by ex post facto designs comparing treated children (intervention participants) to untreated children (Light & Smith, 1970), most often by performance on standardized achievement tests (Jacobs & Felix, 1968). In addition to the increasing difficulty of specifying an untreated sample (Gordon, 1970) and the biasing of the analytic procedures (Campbell & Erlebacher, 1970), achievement instrumentation is culpable for the assertions of failure (see Jensen, 1969) of the experimental educational models. Recent reviews (Baker, 1969; Stake, 1968) indicate that a number of educational researchers have considered the statistical, reliability, and validity problems posed by comparative appraisal of curricula and instructional differences between experimental and nonexperimental programs. In this paper attention will be focused on evaluation perplexities evolving from some of the objectives of intervention programs and some of the characteristics of the target population. An evaluation technique that has the potential for more accurate reflection of the

desired behaviors and more adequate accommodation to the attributes of poor children will be suggested.

Objectives of Experimental Programs

Experimental programs ostensibly differ among themselves for objectives and instructional methodology for attainment of the objectives. However, many of them converge on emphasis of intellectual-process goals and the ancillary conative (skills) and motive objectives for behavioral attainment (Fowler, 1968; Klaus & Gray, 1968; Hughes, Wetzel, & Henderson, 1969). Bronfenbrenner (1969) and Zigler (1970) have strongly advocated the consideration of affective behavioral supports for successful achievement of intellectual socialization and as independent outcomes of schooling processes. In magnifying the importance of conative and motive behaviors as terminal outcomes, experimental intervention varies from nonexperimental approaches. Traditional education has consigned importance to conation and motivation; however, the commitment appears to be to these as facilitators of knowledge acquisition rather than to attainment of them per se (see King & Brownell, 1966; Ragan, 1966, pp. 59-64).

The objectives of conation include the development of a variety of behaviors such as curiosity, gratification delay, risk taking, persistence, activity level, locus of control, information processing strategies, self-esteem, and independence. There exists a paucity of standardized instruments for testing performance outcomes of these objectives (Gordon, 1968; Moughamian, 1965), resulting in under-representation in

evaluation of behaviors affected by experimental programs. Compensation of this dearth may necessitate construction of "criterion referenced items" related to these learning outcomes (Gagne, 1967; Glaser, 1963).

The intellectual-process goals of experimental education denote preferential consideration of the structure of knowledge (Bruner, 1960) and meaningful learning as opposed to rote memorization (Ausubel, 1963; 1968). For many interventionists, these goals reflect theoretical views purporting that the child is actively information-producing (see Hunt, 1961). The instructional technologies are designed to induce information processing such as auditory and visual perception (Deutsch, 1965), concept formation (Gray, Klaus, Miller, & Forrester, 1966; Sigel & Olmsted, 1968), serial approximations to propositions (Resnick, 1963), and spatio-temporal relations (Sonquist & Kamii, 1968). Instructional strategies of traditional approaches concentrate on terminal products utilizing rote memory processes (Bellack & Huebner, 1960).

Process dimensions of intellectual performance have seldom been within the purview of achievement tests (Gordon, 1970; Jacobs & Felix, 1968; Moughamian, 1965) which by definition are concerned with knowledge of facts or the products of learning (Humphreys, 1962). For instance, it is conceivable that two children, one attending an intervention program and one not, would give the same answer to an addition problem. One may determine his answer by counting his fingers and the other may derive his response by the algorithm--if, $a + b = c$; then, $c - b = a$. Conceptually these individual derivations are manifestations of mental

processes. Current achievement evaluation does not elucidate these qualitative differences. That such qualitative cognitive processes have benefits rather orthogonal to I.Q. levels is suggested by the findings of Olton and Crutchfield (1969). Similar results might occur for achievement abilities. Thus, in addition to limiting the potential effects of experimental education by nonsampling of cognitive facilitating behaviors, achievement tests misrepresent the effects of these programs by only examining the results of learning. Meyer (n.d.) has asserted that evaluation of cognitive processes requires orientation to response dimensions not revealed in intellective product assessment. Emphases on process dimensions may demand an orientation to measurement similar to the one Elkind (1969) has adduced for Piaget.

Characteristics of Poor Children

An adjunct to the impact of appraisal instruments on potential schooling effects is the disposition of the economically poor child. In order to elicit behavior indicative of "true" performance ability, the test cues or administrative instructions must consider the characteristics of the examinee. Reissman (1962) has declared that poor children have a better understanding of events than they display in verbally structured situations. Verbal demands necessitate an attending to and understanding of the emitted words. Consequently, it can be adduced from this view that performance levels may be abated by attentional and conceptual behaviors of the poor mandated through

oral instructions.

Responses demanded on achievement tests are usually verbally cued to several children at the same time. However, implications from several studies are that aural stimulation is least effective for cueing responses. Two investigations have demonstrated higher learning for young children, tested individually, as a result of increased attending provoked by three-dimensional stimuli (Rossi & Rossi, 1965; Trabasso, Deutsch, & Gelman, 1966). Other findings have shown higher responses when instructions were vocalized and simultaneously demonstrated with concrete objects (Corsini, 1969; Rosenthal & Zimmerman, 1970). In the Rosenthal and Zimmerman study low socioeconomic status children were compared under verbal instructions accompanied by modeling versus verbal instructing only, with the former yielding greater performance in the test condition. These laboratory findings favoring demonstrated instructions agree with the in naturo observations reported by Meyer (1969).

Research revealing a reliable association between auditory stimulation and decremental performance of poor children is an additional indication that these children are less likely to display effective performance when behavior is elicited orally (Deutsch, 1964; Grimmett, 1970a). Deutsch found that low auditory scores were associated with reading disability for black children. In a sample of Mexican-Americans, Grimmett found that the auditory reception group had a lower performance than an audiotactual group in free learning.

These data suggest that behavioral deficits of poor children may result from disorganized orienting behaviors evolving from instructional presentation to a modality, physiologically functional, but rather insensitive to stimulation. Moreover, verbal instructions given to several children simultaneously probably decrease the signal-to-noise contrast (i.e. more noise contrasted with signal) which might affect stimulus perception (Deutsch, 1964). Compensation for this aural deficit seems to require verbal demands in association with stereometric stimuli.

Another problem confronting test administration to poor children is the understanding of the response needed for successful performance. It is possible that modality reception is above limen, but that imposition of meanings that differ from the intent of the directions result in deficient responding. Caldwell and Hall (1969) have demonstrated that when children apply a meaning consonant with that of the examiner, discrimination performance is significantly improved. This concept understanding produced equivalent discrimination levels for kindergarten and second grade children (Caldwell & Hall, 1970). By changing the syntax of instructions, Etzel (1969) found that performance differences between a deprived and nondeprived group of children were attenuated. Farnham-Diggory's (1970) results of higher verbal synthesis performance subsequent to pretraining, for trained versus untrained low income groups, provides other evidence supporting the import of concepts common to child and test directions for attainment of adequate response levels.

Consonance of meaning can be obtained through pretraining preceding testing as shown by all of these studies.

These data establish the need for test conditions which lessen the potential debilitating effects of oral reception and symbolic misinterpretation. Because these responses seem mediated by the child's internal representational system, could lead to the argument that language deficits of the poor (Bereiter, 1965; Rankin & Henderson, 1968) contaminate performance level on other variables. Although one resolution could be use of nonverbal tests relying primarily on visual stimulation, it seems unreasonable to suggest measurement of behavior by nonverbal tests in view of the complexity of verbal systems controlling actions. What seem more propitious, for provoking behavior compatible with the poor child's internal knowledge structures, are evaluation contexts containing objects, and warm-up in conjunction with correction feedback.

Generalization of Responses

Future achievement instrumentation may correct the neglect of organismic dispositions and intellectual-process and ancillary-skill assessment. Even with the occurrence of these developments, questions can be raised about the validity of paper and pencil devices for such evaluation on the basis of the discrepancy between the acquisition and testing conditions. Testing assumes some degree of generalization enabling performance in a situation nonidentical, but similar, to earlier ones. The kinds of conditions fostering or inhibiting transfer are

seldom mentioned in instrument construction or research (Tyler, 1968). Moreover, item selection procedures for standardized instruments convey desultory attempts to consider the circumscribing environment during test administration. Essentially, test construction seems subtended by the notion that measurement incises permanent traits of the individual. That this position is tenuous is alluded to in the deliberations of a subcommittee of the Social Science Research Council. This Subcommittee on Compensatory Education (1970) resolved that "Learning, performance, attitudes, curiosity, etc. will not be thought of as characteristics which the child possesses independently of the setting in which they are manifested." Additional evidence supporting the untenability of presuming that discrepant acquisition and test circumstances are irrelevant to responding is a serendipitous finding of an in-progress study by Underwood (personal communication) at the Arizona Center for Early Childhood Education. She is developing a programmed procedure, using a mechanical training device, for left-right discrimination of letter orientation. The children are pretested on a paper and pencil device and are subsequently taught left-right orientation to criterion. Three children have achieved criterion but only one transferred this behavior to the paper and pencil posttest. This tentative finding undeniably suggests that testing instrumentation affects response generalization.

Empirical data on several of the cognitive supportive behaviors have revealed that response levels are influenced by the situation. For

instance, the converse of delay of gratification, need of immediate reinforcement, has been found dependent upon social reinforcement satiation (Gewirtz, 1969). Gross and discreet stimuli have affected persisting behaviors (Grimmett, 1970a; Turnure, 1970). When subjected to different task demands, reliable changes in persistence have been manifested in association with task requirements (Allen, 1966 Wyer, 1968). Stimulus redundancy has been shown a determinant of curiosity level (Berlyne & Frommer, 1966; Cantor, 1963; Dember & Earl, 1957; Smock & Holt, 1962). Conceptual categorical operations have been affected by the kind and representation of the stimuli (Glick & Wapner, 1968; Szeminska, 1965). Implications from these data are that responses are associated with the stimulus context; and since response generalization relies upon similarity of conditions (Ellis, 1965), it too is affected.

Achievement tests, in general, have failed to consider conditions influencing generalization, the prepotent dispositions of poor children, and the cognitive skill and process goals of experimental education. This ineffectualness of current standardized instruments for comparative curricula evaluation and for the poor population substantiates Meier's (1967) declaration that "the clarion call has been issued for fundamentally different evaluative techniques which appropriately assess...the quantity and quality of growth along newly conceived dimensions considered important for effective early childhood intervention procedures" (p. 176).

Researcher who are decrying current methodology are asserting the need to individualize testing, citing among others, Skinner's (1953) techniques, as precedents (Stake, 1968). Gordon (1970) has urged the evaluation of intellectual processes and their eliciting conditions. Educible from these positions is the need for functional analysis of behavior, a thesis proposed by Bridgman (1954) for understanding behavior not easily ascertained by verbal report and for comprehending behavior in association with its antecedent stimuli. Functional analysis of behavior is a procedure allowing a more direct discernment of the relationship between the response and its activating conditions.

Methodology of the Laboratory

According to Jensen (1961), the criteria which should be used in selecting a procedure for more direct appraisal of poor children's performance: (1) verbal ability in itself should not be critical in determining performance; (2) task demands should be equally comprehensible to children of different subcultures. The author would add a third criterion--the task properties should be sufficiently similar to the acquisition conditions so as to maximize generalization. These are the heuristics of functional analysis which, in turn, necessitate an environment capable of inducing intellective processes and cognitive facilitating behaviors.

Recent literature contains many methodologies that satisfy the criterial restrictions while being predisposed to a functional analysis of behavior. Perhaps the most renowned proclaimer of these kind of

techniques is Piaget (1964). He has developed the méthode clinique which comprises presenting stimuli to the child, with further reaction consequent to the child's response. Piaget was more interested in how one derives an answer than in how many answers one knows (Flavell, 1963); therefore, he applied qualitative measures to test responses. A more standardized method for testing the behaviors of importance to Piaget has been developed by Goldschmid and Bentler (1968). They have constructed a test which retains the qualitative appraisal of cognitive operations within a systematized technique allowing instrumental responses.

The Kendlers (Kendler & Kendler, 1967) have studied reasoning using a rather ingenious, yet simple, apparatus. These experimentalists systematically trained each necessary test response individually and evaluated the child's chaining of these responses to achieve success. Appropriate chaining denoted an inferrential solution. The absence of inference and the kind of errors were noted during unsuccessful attainment.

Inference has also been studied by Bruner (1966), who used a different stimulus context. He designated as strategy the behavioral chain that indexes inferring. The model for this procedure is the game, Twenty Questions, which can be efficiently solved by successive partitioning of the stimuli, thereby increasing the specificity of solution. Many modifications of this procedure have occurred in the literature (Eimas, 1970; Grimmett, 1970b; Tougas & Rowan, 1966). Eimas computed

the maximum number of chained questions to solution for the amount of stimuli he used and thereform distinguished directed thinkers and non-directed thinkers.

Other well-established technologies appropriate to the study of intellect processes are the instrumental responses to pairs of shifts (House & Zeaman, 1963), sorting stimuli (Sigel & Olmsted, 1968), and oddity (Gollin & Shirk, 1966).

A search of the research literature on cognitive facilitating behaviors would reveal similar methods using degrees of stimulus representativeness of reality. Notable among these are the procedures of field independence-dependence by Witkin (Witkin, Dyk, Faterson, & Goodenough, 1962), self-esteem by Bandura (1969), activity level by Maccoby (Maccoby, Dowley, Hagen, & Degerman, 1965), and curiosity by Berlyne (Berlyne & Frommer, 1966) and Mendel (1962).

The commonalities of the procedures in these researchers are the utilization of instrumental responses, the association of the response to the inducing context properties, and the assessment of the quality of the behavior. These procedures bring the stimulus context and the individual into a combinatorial relationship, a transaction, in which operations on the environment, as opposed to reactions to the environment, have primacy. A stimulus context evidencing such characteristics has been identified as a situational test, a condition requiring an "actual adaptive response, rather than a mere 'test' response (English & English, 1958, p. 504)." Mandated is problem confrontation, the resolution of which has some relevance for the "real world."

Evaluation by Situational Tests

Situational tests have most often been a tool of the laboratory psychologist. However, these kinds of tests are not new to measurement, as the well-known Stanford-Binet includes subtests that are situational. Two recent test batteries have incorporated situational test techniques in varying degrees to appraise young children. One of these batteries is being developed by Meier (1967). He has stressed that the tests elicit overt responses known from schooling experiences and confront the child with familiar simulated tasks. Several of the tests are sufficiently similar to curriculum procedures that they could substitute for learning activities. A television-type apparatus is the delivery system for most of the subtests. The perception test is situational, measuring kinesthetic coordination and memory.

The Cincinnati Autonomy Test Battery (Banta, 1968) was constructed to sample problem-solving behaviors of children between the ages three and six. The battery consists of a series of situational tasks during which the child is given warm-up so as to assure his understanding of the test responses. Banta has stated, "The present tests are concerned with the ways in which a child solves a problem, not just his ability to perform a task 'correctly' (p. 3)."

These tests and the previously mentioned test by Goldschmid and Bentler (1968) indicate efforts to extend measurement to skills usually neglected by achievement evaluation. It is notable that the developers employed situational tests designed to be similar to school learning

activities instead of paper and pencil devices. This is not to deny development of self-report instruments for measuring some conative and motivational behaviors (Maw & Maw, 1970; Penney & McCann, 1964; Soares & Soares, 1969). However, if Katz's (1967) statement on the significance of Bandura's methodology for advancing techniques in the study of motivational phenomena can be generalized, then cautious pessimism may be expressed for the efficacy of paper and pencil measurement of conation and motivation, especially for young children.

Discussion

Because of the limitations of current instruments eliciting written responses of children as indices of cognitive skill repertoires, and the incapability of these instruements to measure cognitive processes, a reasonable alternative for alleviating these circumstances is situational tests. In addition, numerous laboratory studies appraising cognitive facilitating behaviors attest to the amenability of situational tasks for the study of these variables. On the basis of the evidence and interpretive statements of the needs of intervention programs, the charateristics of poor children, and response generalization, situational tests are recommended as an evaluation approach.

Components of a situational task involving cogitation are:

1. acquisition or demonstration of the required response class;
2. verification of comprehension of instructions;
3. diminution of dependency on verbal behavior;

4. simulation of reality contexts;

5. consecution of behavioral repertoire components;

6. standardization of procedures for comparability.

These facets connote the differences between situational tests and prosaic achievement tests. It is possible to educe from these components conceivable advantages for measurement by situational tests.

One advantage of situational tasks is that the procedure can account for the recent history of the examinee. By doing so, the required response for success and comprehension of the instructions can be provided, constituting the proximal history. This means that a child who may have the requisite behavior is not failed because the syntactic structure of the instructions provoke a deep-structure discrepant with the semantic intent. By equating response adequacy and directional concepts, it is presumable that differential behavior is, in part, attributable to more distal experiences of which schooling is a factor.

Another advantage of situational tests is facilitation of generalization. Schooling activities require instrumental operations on phenomena for acquisition of knowledge in many of the experimental programs. Situational tests contain, by definition, assessment of adaptive responses. Consequently, they potentiate testing contexts that are familiar to the child. This similarity between the test-of-learning and acquisition activities should be conducive to positive transfer. Construction of achievement tests seems to dissociate acquisition and testing environment.

Even though both kinds of testing (achievement and situation) assess behavioral elements, situational tests can specify the antecedents inducive of the behavioral "bit". This gives situational tasks a third advantage, that of allying behavior to a context through functional analysis. By associating the antecedent soliciting configuration with the response, one can detect with greater confidence the range and variation of operations employed by the children to attain solutions. These kinds of individual differences are confined to error variance in current psychometric procedures (Hendel & Weiss, 1968).

Situational tasks as a measurement methodology are not without disadvantages. Some of these, such as subtle response influences emanating from sex and race of the experimenter, have been stipulated in a review of experimenter effects on various subcultures (Sattler, 1970). Other disadvantages are associated with the reliability of the experimenter. And, an additional source of difficulties is related to the effects of reinforcement and knowledge of results during testing. These parameters need clarification for the development of situational tests into an applicable technology for comparative educational evaluation.

Achievement tests will, no doubt, continue to be of importance to education for the designation of a person's status. However, experimental intervention is demanding a different view of schooling, that of preventive remediation. To prevent decremental behaviors, many intervention programs are emphasizing deriving information as

opposed to transmitting knowledge. Situational tests afford an opportunity to assess these derivations as chained behaviors indicative of information processing in a context conducive to response generalization. The author contends that these kinds of tests are demanded for more adequate representation of the effects of intervention given the characteristics of the target population.

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